

**WHAT IS CLAIMED IS:**

1. A method of identifying a fungicide, comprising
  - 5 (a) bringing ribose-5-phosphate isomerase enzyme or a host cell comprising a polypeptide from phytopathogenic fungi encoded by a nucleic acid with the biological activity of ribose-5-phosphate isomerase. into contact with a chemical compound or a mixture of chemical compounds under conditions which allow the interaction  
10 of the chemical compound or the mixture of chemical compounds with the ribose-5-phosphate isomerase enzyme or the polypeptide,
  - (b) comparing ribose-5-phosphate isomerase activity in the absence of the chemical compound or the mixture of chemical compounds with  
15 the ribose-5-phosphate isomerase activity in the presence of the chemical compound or the mixture of chemical compounds, and
  - (c) identifying the chemical compound or mixture of chemical  
20 compounds which specifically inhibit ribose-5-phosphate isomerase activity.
2. The method according to Claim 1, fungicidal action of the identified chemical compound or mixture of chemical compounds is tested in a  
25 subsequent step (d) by bringing said identified chemical compound or mixture of chemical compounds into contact with a fungus.
3. A method of identifying one or more fungicidal compounds comprising  
30 identifying said fungicidal compound with a member selected from the group consisting of a polypeptide having the biological activity of ribose-5-phosphate isomerase, a nucleic acid encoding a polypeptide with the

biological activity of ribose-5-phosphate isomerase and one or more host cells said host cell including a polypeptide having the biological activity of ribose-5-phosphate isomerase.

- 5     4.     A fungicide, said fungicide comprising a modulator of a polypeptide having the biological activity of ribose-5-phosphate isomerase.
5.     A method for controlling phytopathogenic fungi comprising controlling phytopathogenic fungi with a modulator of a polypeptide having the biological activity of ribose-5-phosphate isomerase..
- 10     6.     A fungicidal modulator of a polypeptide having the biological activity of ribose-5-phosphate isomerase which modulator is identified by a method according to Claim 1 or 2.
- 15     7.     A nucleic acid encoding a polypeptide from phytopathogenic fungi with the biological activity of ribose-5-phosphate isomerase.
- 20     8.     The nucleic acid as claimed in Claim 7, wherein said nucleic acid encodes a *U. maydis* ribose-5-phosphate isomerase.
- 25     9.     The nucleic acid according to Claim 7 or 8, wherein said nucleic acid takes the form of single-stranded or double-stranded DNA or RNA or fragments of genomic DNA or cDNA.
10.     The nucleic acid as claimed in Claim 7, comprising a sequence selected from
  - a)     the nucleic acid sequence of SEQ ID NO: 1,

- b) a nucleic acid sequence which encodes a polypeptide with the amino acid sequence of SEQ ID NO: 2,
- 5 c) a nucleic acid sequence which encodes a polypeptide with at least one of the consensus sequences of the following group of consensus sequences:  
-(I/V)GIGSGSTV-, -(I/V)D(I/V)X<sub>2</sub>DGADE(I/V)DX<sub>2</sub>LX<sub>2</sub>IKGG-, -(P)TG(F/D)Q SX<sub>2</sub>LI-, -EK(V/L)X<sub>4</sub>AX<sub>2</sub>F(I/V)XVADX(R/S)K-, -WX<sub>2</sub>G(I/V)PIEVXP-, -AKAGP(I/V)VTDNXXNFX(I/V/L)D-, -  
10 IKXLXGVXEXGLF-, -AYFGNXDG-,
- d) part-sequences of the sequences defined under subparts a) to c) of this Claim 10 which are at least 15 base pairs in length,
- 15 e) sequences which hybridize with the sequences defined under subparts a) to c) of this Claim 10 at a hybridization temperature of 42-65°C,
- f) sequences with at least 60% identity with the sequences defined under subparts a) to c) of this Claim 10,
- 20 g) sequences which are complementary to the sequences defined under subparts a) to f) of this Claim 10, and
- h) sequences which, owing to the degeneracy of the genetic code, encode the same amino acid sequence as the sequences defined under subparts a) to c) of this Claim 10.
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11. A DNA construct comprising a nucleic acid according to any one of Claims 7 to 10 and a heterologous promoter.

12. A vector comprising a nucleic acid according to any one of Claims 7 to 10,  
or a DNA construct according to Claim 11.
13. A vector according to Claim 12, wherein the nucleic acid is linked operably  
5 to regulatory sequences which ensure the expression of the nucleic acid in  
prokaryotic or eukaryotic cells.
14. A host cell comprising a member selected from the group consisting of a  
nucleic acid according to any one of Claims 7 to 10, a DNA construct  
10 according to Claim 11 and a vector according to Claim 12 or 13.
15. A polypeptide from phytopathogenic fungi having the biological activity of  
ribose-5-phosphate isomerase, wherein said polypeptide is encoded by a  
nucleic acid according to any one of Claims 7 to 10.  
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16. A method for finding a chemical compound or a mixture of chemical  
compounds according to Claim 1 or 2, comprising identifying said chemical  
compound or mixture of chemical compounds with a polypeptide according  
to Claim 15.
- 20 17. A method of finding a compound which modifies the expression of the  
polypeptide defined in Claim 15, comprising:
- 25 (a) bringing a host cell according to Claim 14 into contact with a  
chemical compound or a mixture of chemical compounds,
- (b) determining a polypeptide concentration, and
- (c) identifying the compound or mixture of compounds which influence  
the expression of the polypeptide.